DOCUMENT RESUME

ED 199 009 RC 012 573

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TITLE An Analysis of the North Central United States with Particular Reference to Vocational Training Needs and Opportunities for Rural Students.
SPONS AGENCY National Inst. of Education (ED), Washington, D.C.
PUB DATE Oct 80
NOTE 63p.; For related documents, see RC 012 572 and RC 012 574-578.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adult Vocational Education; Agricultural Education; Apprenticeships; Community Attitudes; *Demand Occupations; Educational Needs; *Educational Opportunities; *Employment Opportunities; Employment Patterns; Labor Market; Migration; Population Distribution; Postsecondary Education; Regional Schools; *Rural Areas; Secondary Education; Service Occupations; *Vocational Education; Vocational Schools
IDENTIFIERS *Missouri; *United States (North Central)

ABSTRACT

Recent changes in patterns of population location, industrial employment, and technology in the north central United States have produced implications for vocational education in rural areas. Missouri has greater social, cultural, demographic, and economic diversity than other states in the region, but is representative of the area for purposes of developing implications for rural vocational education. Area vocational schools are the primary means through which Missouri's rural students gain vocational training opportunities. About 70% of those who graduate from secondary and postsecondary programs are employed as trained. However, a demand for some services in rural areas is not being met: no vocational training programs exist for many of the more interesting and remunerative careers in rural communities because there is no mass market for the skill. To correct this, Missouri has experimented with a contract vocational education program of apprenticeship training. Trainers are community residents and employers who have skills for which there is a demand and no existing training program. In addition, a four-year secondary vocational agriculture program emphasizes general knowledge and entrepreneurship. Areas of projected rural employment growth include health care, accounting, computer technology, repair services, law enforcement, child care, transportation, retailing, and energy related careers. Statistical trends in population, income, economic base and education are detailed for the north central states. (CM)

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# An Analysis of the North Central United States with Particular Reference to Vocational Training Needs and Opportunities for Rural Students

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RC 012573

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{This study was conducted under contract from the National Institute of Education.}

## INTRODUCTION

Vocational education has clearly become an instrument of national economic development and manpower policy. That policy seems to have been guided largely by the need to produce a labor force having a skill and capable of geographic mobility. During the first 2/3 of the 20th century the major theme of labor force movement and development was the uninterrupted stream of rural migrants into the urban and industrial labor force. For the most part these migrants brought with them a work ethic, a motivation to succeed and the fundamentals to learn a trade or skill. More recently the capacity of the industrial economy to absorb these migrants appears to have diminished to some extent and some apparent changes in perceived factors influencing quality of life have combined to attenuate this undirectional flow. In recent years some industrial decentralization has occurred, older industrial cities have been declining in economic base and population and there has been a very visible shift in the regional distribution of industrial employment,

These factors have all had an important influence on the directions of change in the north central region of the U.S. Both intra and inter regional population movements have effected the region importantly. The first section of this report will be devoted to analysis of some of those changes.

The basic theme of this report concerns how some of the recent changes in patterns of population location, industrial employment and technology have combined to produce implications for vocational education especially for rural areas. We devote a majority of the report to developing some prospects for different approaches to vocational education in rural areas - approaches which depart from the perspective of the "one best system" which appears to have been the dominant influence on the types, location and substance of vocational education opportunities offered to rural youth up to the present. We do not attempt to develop an alternative model suited to rural vocational education needs. Rather we emphasize the diversity of rural circumstances which should betaken into account in developing appropriate vocational training and attempt to identify some areas which might be productive of additional employment in some rural areas.

North Central Region

The north central region comprising the 12 states from Ohio west through the Dakotas have always been the agricultural heartland of the U. S. As agriculture began to commercialize in the 1800's major cities first serving the agricultural sector began to emerge. Minneapolis became the flour miller of the country, Chicago a major meat packing and farm machinery center, Kansas City a center for grain terminals, meat packing and farm supply cooperatives. Having had their origins as centers of agribusiness these and most other cities in the middlewest continued their growth with a much more diversified economy. The middlewest became a major producer of steel (Gary, Indiana), automobiles (Detroit, St. Louis, Kansas City), aircraft (Dayton, Ohio, St. Louis, Wichita, Kansas). As the economy moved into the computer age so too did the industrial base of the region with the production of electronic technology, chemicals, and services becoming prominent.

Although agriculture in the region continues to produce more and greater output it is simultaneously shrinking as a proportion of the economic base of the region. It is only when the entire agribusiness sector is combined that total agricultural income and employment within the region maintains a proportionate share of regional output.

Throughout the heart of the corn and wheat belt farms continue to become larger, fewer in number and represent greater output and capital investment. The non-metropolitan population of the region holds at about 23 percent for the eastern half and about 48 percent for the western half. However that population is very heavily rural non-farm and becoming more so all the time.

The remainder of this section will be devoted to a further delineation of characteristics of the region with particular attention to those which influence the need for and the kind of vocational education.

Population

During the first seven years of the decade of the 70's all states in the region increased in population. The lowest percentage increase was in Ohio while the largest was North Dakota. All states experienced a net out-migration with the exception of Wisconsin which had a modest net-in-migration. Contrary to the 50's and 60's however the rate of net out-migration from the rural states subsided significantly. Three of the states in the region - Ohio, Illinois and Michigan are among the most populated in the country while three others - Nebraska, South Dakota and North Dakota are among the least populated.

The important population dynamic of the 1970's has been the migration "turn-around" which has affected most rural regions in the country. This turnaround represents a shift from the pattern previously uninterrupted in this century for the farm and usually the rural population to decline as a result of mechanization of agriculture. As a result cities initially, and then later the suburbs created around them increased dramatically in population. Contributing to this was the relatively high birth rate following World War II and the continuing stream of relatively young and well-educated from rural areas seeking both higher paying employment, more comprehensive services and diverse lifestyle associated with urban areas. Both middle sized and major cities in the north central region were frequent recipients of this migration stream - the popularity of California notwithstanding.

Beginning in the late 1960's however the direction of that flow began to change both as a result of people moving from metropolitan to non-metropolitan areas but also as a result of greater numbers of rural youth and young adults exercising the option of remaining rural. Reasons for this change are legion but important among them is an apparent expression of residential preference. Quality of life and residential preference studies typically show a perceived differential in quality in life between metro and non-metro in favor of small towns and places.

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Table 1

Population change north central region - 1970-1977

| | Pop. 1970 | Est. 1977 | Percent change |
|---|---|---|---|
| Ohio | 10,652 | 10,701 | +0.5% |
| Michigan | 8,875 | 9,129 | +2.9% |
| Indiana | 5,194 | 5,330 | +2.6% |
| Illinois | 11,114 | 11,245 | +1.2% |
| Wisconsin | 4,418 | 4,651 | +5.3% |
| Minnesota | 3,805 | 3,975 | +4.5% |
| Iowa | 2,825 | 2,879 | +1.9% |
| Missouri | 4,677 | 4,801 | +2.7% |
| Kansas | 2,249 | 2,326 | +3.4% |
| Nebraska | 1,848 | 1,561 | +5.2% |
| South Dakota | 666 | 689 | +3.5% |
| North Dakota | 618 | 653 | +5.7% |

Although there has been much discussion of the population "turnaround" this decade, it has manifested itself in the midwest primarily in a slower rate of growth of metropolitan areas (in contrast to the 50's and 60's) and a shift from population loss to either stability or growth among many non-metropolitan counties. One major exception to that generalization is southern Missouri which has experienced significant rural population increase. That region will be analyzed in greater detail later.

When the effect of the "turnaround" is evaluated for the region as a whole (Table 2) it is found that for most states both metropolitan and non-metropolitan areas have experienced relatively slow growth. Metropolitan growth is occurring most significantly in the least populous states - Nebraska, South Dakota, North Dakota. Generally the metropolitan growth rate is least for the most populous and industrial states - Ohio ( a decline), Michigan, Indiana, Illinois and Missouri.

As a result of population shifts the more industrial states in the region have all become slightly more non-metropolitan this decade while the more agricultural states have all become slightly more metropolitan. As may be observed from Table 2, the percent of non-metropolitan population of the total has increased in Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota and Missouri. Conversely non-metropolitan population has declined as a percent of the total in Iowa, Kansas, Nebraska, South Dakota and North Dakota. Despite these shifts however, those states remain more non-metropolitan than metropolitan.

Definition of rural

Although most of us have some general idea of what is meant by rural, there are difficulties in translating that idea into concise criteria. We won't devote much space to the range of possible definitions. For our purposes midwest counties with a population of less than 10,000 will be regarded as clearly rural while those counties with a population of 10,000-24,999 will be regarded as generally rural (partially dependent on their location). Counties of 25,000-49,999 population are very often dominated by a major rural trade center most of which in recent years have achieved some important degree of industrialization. Throughout most of the corn belt, counties having a population in excess of 50,000 are thought of as being urban even if they do not meet the census definition of a metropolitan area. Given that set of categories there is a very clear difference in degree of rurality between Ohio, Indiana, Michigan, Illinois, Wisconsin and the remaining seven states. In each of those five states more than 50 percent of the counties have a population in excess of 25,000. They are led by Ohio in which 5 out of 6 counties have a population greater than 25,000 and nearly 50 percent have a population of more than 50,000. By contrast the four plains states (Nebraska, Kansas, South and North Dakota) have a very high proportion of their counties falling in the under 10,000 category. The three middle states in the corn belt - Iowa, Missouri and Minnesota have a high percentage of their counties in the 10,000 to 24,999 range. Given the relative absence of major industrial centers in Iowa and the four plains states a major reason for the difference in modal population category is the relative productivity and value of the land. Because of higher land quality, the average size of farms in Iowa is about 1/2 the size of the four plains states.

Summarizing from the above the states in the corn belt range widely in terms of their relative population density and thus degree of urban dominance. The rank order of states in terms of the percentage of counties having a population of 25,000 or more is as follows:

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| | |
|---|---|
| Ohio | 83.0% |
| Michigan | 56.6% |
| Wisconsin | 56.4% |
| Indiana | 55.4% |
| Illinois | 49.0% |
| Minnesota | 33.3% |
| Missouri | 26.1% |
| Iowa | 25.2% |
| Kansas | 17.1% |
| Nebraska | 12.9% |
| North Dakota | 7.6% |
| South Dakota | 4.5% |

The above demonstrates further the prior division of the corn belt into essentially three regions - the five states east of the Mississippi River (Ohio, Indiana, Illinois, Wisconsin, Michigan), the three middle states of Minnesota, Iowa and Missouri, and the four plains states of Kansas, Nebraska, South and North Dakota.

TABLE 2. Metropolitan - non-metropolitan population changes 1970-1977

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| | METROPOLITAN | | | NON-METROPOLITAN | | |
|---|---|---|---|---|---|---|
| | Pct. of Total | | Pct Chg | Pct. of Total | | Pct Chg |
| | 1970 | 1977 | 1970-77 | 1970 | 1977 | 1970-77 |
| U.S. | 73.6 | 73.0 | 5.5 | 26.4 | 27.0 | 9.2 |
| Ohio | 80.7 | 79.8 | - .7 | 19.3 | 20.2 | 4.7 |
| Michigan | 82.8 | 81.3 | 1.6 | 17.2 | 18.7 | 12.4 |
| Indiana | 68.0 | 67.8 | 2.6 | 32.0 | 32.2 | 3.8 |
| Illinois | 81.5 | 81.3 | .9 | 18.5 | 18.7 | 2.1 |
| Wisconsin | 63.9 | 63.0 | 3.7 | 36.1 | 37.0 | 7.7 |
| Minnesota | 64.4 | 63.9 | 4.8 | 35.6 | 36.1 | 7.1 |
| Iowa | 36.6 | 37.4 | 4.5 | 63.4 | 62.6 | .9 |
| Missouri | 65.0 | 63.5 | .6 | 35.0 | 36.5 | 7.7 |
| Kansas | 46.0 | 46.2 | 3.6 | 54.0 | 53.8 | 2.8 |
| Nebraska | 42.9 | 44.6 | 8.8 | 57.1 | 55.4 | 1.6 |
| S. Dakota | 25.8 | 27.9 | 11.8 | 74.2 | 72.1 | .2 |
| N. Dakota | 21.8 | 22.7 | 9.8 | 78.2 | 77.3 | 4.1 |

We emphasize the range of population density in the north central region to provide some further perspective on rural vocational education. The tendency at national policy levels to equate rural with non-metropolitan has significantly different implications for Ohio where few counties are beyond easy commuting distance (for both work and services) from a metro area, than for North and South Dakota and Nebraska where there are no metropolitan counties in the western 400 miles.

The distinction rural and urban is far too general to be of value. It is at least partially determined by context. In an attempt at refinement a classification which is often being used in government reports and analysis is as follows:

I. Metropolitan (SMSA) counties
   1. greater metropolitan - counties of SMSA's having at least 1 million population
      a. core counties - counties containing the primary central city
      b. fringe counties - suburban counties of greater metro areas
   2. medium metropolitan - SMSA's having a population of from 250,000 to 999,999
   3. small metropolitan - SMSA's of less than 250,000

II. Non-metropolitan (none-SMSA) counties
   4. urbanized adjacent - counties contiguous to SMSA's and having an aggregate urban population of at least 20,000
   5. urbanized not adjacent - counties not contiguous to SMSA's and having an aggregate urban population of at least 20,000
   6. less urbanized adjacent - counties contiguous to SMSA's and having an aggregate urban population of 2,500 - 19,999
   7. less urbanized non-adjacent - counties not contiguous to SMSA's and having an aggregate urban population of 2,500 to 19,999.
   8. Totally rural adjacent - counties contiguous to SMSA's and having no urban population
   9. Totally rural not adjacent - counties not contiguous to SMSA's and having no urban population.

Ross, Peggy, et al Indicators of Social Well-Being for U. S. counties. Rural Development Research Report No. 10. Economics, Statistics and Cooperative Service, U.S.D.A. Washington, D.C. May 1979

## Per Capita Income

Per capita income for the region is generally about the U. S. average although it increased slightly more than the U. S. average for the period 1970-78. The highest per capita income is in Illinois which ranks fourth in the U.S.; The lowest in the region is South Dakota which ranks 35th.

The four states having had the greatest percentage increase in per capita income during the 1970's are Iowa, Kansas, North Dakota and South Dakota. These are states in which agriculture comprises a major portion of the economic base. The increase is attributable primarily to general increases in agricultural prices and farm income during the 1970's.

Table 3 Per Capita Personal Income 1970-1978

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| | 1970 | 1978 | Change | % Change |
|---|---|---|---|---|
| Illinois | 4,446 | 8,903 | 4457 | 100.2% |
| Indiana | 3,709 | 7,706 | 3997 | 107.8% |
| Michigan | 4,041 | 8,483 | 4442 | 109.9% |
| Ohio | 3,949 | 7,855 | 3906 | 98.9% |
| Wisconsin | 3,712 | 7,532 | 3820 | 102.9% |
| Iowa | 3,643 | 8,002 | 4359 | 119.7% |
| Kansas | 3,725 | 7,882 | 4157 | 111.6% |
| Minnesota | 3,819 | 7,910 | 4091 | 107.1% |
| Missouri | 3,654 | 7,313 | 3659 | 100.1% |
| Nebraska | 3,657 | 7,582 | 3925 | 107.3% |
| North Dakota | 3,077 | 7,174 | 4097 | 133.2% |
| South Dakota | 3,108 | 6,864 | 3756 | 120.8% |
| United States | 3,893 | 7,836 | 3946 | 101.4% |

## The Economic Base

Except for the plains states the region is important in the U.S. both for agricultural production and manufacturing. Table 5 reports gross farm income (marketing receipts) for the year 1977. As may be observed from that table the region includes 9 of the 11 most productive agricultural states in the country. However as may be noted from Table 4 the region is also important in manufacturing including 6 of the 13 most productive manufacturing states in the country, Ohio, Michigan and Illinois rank among the top five.

In terms of industrial and agricultural mix however it is clear that indus-

try represents a disproportionately greater part of the economic base of the region. Only in Nebraska, North and South Dakota do gross farm receipts exceed value added by manufacturing. Value added by manufacturing exceeds gross farm receipts even in Iowa which is the Number 2 ranking agricultural state in the country.

The agricultural and manufacturing mix has important implications for vocational training. In Ohio, Michigan and Illinois for example the number employed in manufacturing exceeds the number of farms by more than 10 to 1. Only in South Dakota and North Dakota do the number of farms exceed the number employed in manufacturing.

Table 4
Manufacturing Employment, Value Added - 1976

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| Manufacturing | Total Emp. | Millions Payroll | Value Added | National Rank |
|---|---|---|---|---|
| Ohio | 1,283 | 17,855 | 37,724 | 3 |
| Michigan | 1,050 | 17,107 | 32,390 | 5 |
| Indiana | 677 | 9,159 | 19,983 | 9 |
| Illinois | 1,256 | 16,831 | 36,084 | 4 |
| Wisconsin | 520 | 6,611 | 14,906 | 11 |
| Minnesota | 306 | 3,893 | 8,473 | 19 |
| Iowa | 231 | 2,995 | 7,799 | 22 |
| Missouri | 424 | 5,060 | 11,121 | 13 |
| Kansas | 168 | 1,950 | 4,859 | 28 |
| Nebraska | 88 | 987 | 2,692 | 35 |
| South Dakota | 22 | 217 | 494 | 47 |
| North Dakota | 14 | 139 | 387 | 48 |

Table 5
Gross farm income 1977, number of farms and average size 1974

| State | 1977 Gross Farm Income | National Rank | 1974 Number of Farms | 1974 Average Size |
|---|---|---|---|---|
| Ohio | $2.827 | 11 | 92,158 | 170 |
| Michigan | 1,845 | 19 | 64,094 | 169 |
| Indiana | 3.261 | 8 | 87,915 | 191 |
| Illinois | 5.824 | 4 | 111,049 | 262 |
| Wisconsin | 3.178 | 9 | 89,479 | 197 |
| Minnesota | 4.405 | 5 | 98,537 | 280 |
| Iowa | 7.094 | 2 | 126,104 | 262 |
| Missouri | 2.921 | 10 | 115,711 | 258 |
| Kansas | 4.086 | 6 | 79,188 | 605 |
| Nebraska | 4.073 | 7 | 67,597 | 683 |
| South Dakota | 1.705 | 24 | 42,825 | 1074 |
| North Dakota | 1.662 | 25 | 42,710 | 992 |

As noted earlier the region has steadily declined in farm numbers and farm population primarily as a result of extensive mechanization. This is a process which has been operating throughout this century. Tables 6 and 7 provide some data on the magnitude of these changes. As may be observed from Table 6, the region's farm population has declined dramatically over the past 40 years. Even with the rapid decline the region has not experienced the rate of decline characteristic of the nation as a whole. No state within the region has declined as much as the rate of decline for the U. S. Generally the more industrial states within the region lost proportionately greater farm population than the more agricultural states.

The rate of decline of farm population follows closely the rate of decline in farm numbers. Table 7 shows the loss in farm numbers by state for the period 1964-1974. Again it is the more industrial states which have experienced the most significant decline.

Agriculture is far from being a homogeneous sector of the regional economy. Professor Wayne Rohrer of Kansas State University describes farming as being separable according to the motives of the operating family.

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TABLE 6. Farm population 1940-1970 - north central region

| | (1,000's) 1940 | (1,000's) 1970 | Pct. Change |
|---|---|---|---|
| U.S. | 30,547 | 9,712 | -68.2 |
| Ohio | 1,089 | 415 | -61.9 |
| Michigan | 871 | 305 | -65.0 |
| Indiana | 816 | 416 | -49.0 |
| Illinois | 979 | 473 | -51.7 |
| Wisconsin | 883 | 445 | -49.6 |
| Minnesota | 915 | 482 | -47.3 |
| Iowa | 931 | 544 | -41.6 |
| Missouri | 1,125 | 395 | -64.9 |
| Kansas | 607 | 252 | -58.5 |
| Nebraska | 498 | 253 | -49.2 |
| S. Dakota | 307 | 172 | -44.0 |
| N. Dakota | 329 | 154 | -53.0 |

TABLE 7 . Number of farms - change 1964 - 1974

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| | NUMBER OF FARMS (1,000) | | |
|---|---|---|---|
| | 1964 | 1974 | Pct. Change |
| U.S. | 3,158 | 2,314 | -26.7 |
| Ohio | 120 | 92 | -23.3 |
| Michigan | 94 | 64 | -31.9 |
| Indiana | 108 | 88 | -18.5 |
| Illinois | 133 | 111 | -16.5 |
| Wisconsin | 119 | 89 | -25.2 |
| Minnesota | 131 | 99 | -24.4 |
| Iowa | 154 | 126 | -18.2 |
| Missouri | 147 | 116 | -21.1 |
| Kansas | 92 | 79 | -14.1 |
| Nebraska | 80 | 68 | -15.0 |
| S. Dakota | 50 | 43 | -14.0 |
| N. Dakota | 49 | 43 | -12.2 |

He refers to a distinction between farming as venture (commercial -income being a major consideration) and farming as refuge (residential - farming as a place to live). Overall agriculture production has moved toward greater consolidation on a smaller number of farms. Today six percent of the farms are responsible for producing about 55 percent of total agricultural output. Consequently from a manpower perspective it can be misleading to look at total farm numbers as a basis for projecting demand for commercial farmers. Within the region there is a wide distribution of farms according to the amount of produce marketed. Table 8 shows the percentage of farms falling into each of three output categories by state. As may be noted from Table 8, Missouri, Michigan and Ohio lead the region in the proportion of non-commercial farms (those with sales less than $2,500). In each of those states about 1/4 of the total number of farms fall in that category. Conversely the large farm income states - Iowa, Nebraska, Illinois lead the region in the proportion of farms falling in the large commercial class. More than 40 percent of Iowa's farms produced more than $40,000 in total output in 1974. Today a much larger percentage of Iowa farms would fall in that category.

Balanced against the large capital intensive commercial farms are large num-

bers of small, part-time and refuge farms. A number of rural sociologists at the University of Missouri (including the author) recently completed a survey of all open country residents in a five-county area in the south east central Missouri Ozarks. The survey conducted in 1977 showed that of total open country residents (in what are very rural counties) only 50 percent were living on places of one acre or more. Of that 50 percent, only 38 percent were selling as much as $500 of agricultural produce per year. The typical "farm" in the Missouri Ozarks is one on which the "farmer" has a full-time job off the farm. His farming operation is important to him for both personal and financial reasons, but he does not depend on it as a primary source of cash flow income. Although this trend is most pronounced in Missouri, it can be found extensively in Michigan, Indiana, Wisconsin, Minnesota, Ohio and Illinois as well. Most agricultural economists seem to concur that the trend toward fewer and larger commercial farms will continue but also that farming as "refuge" will attract larger numbers of people.

TABLE 8. Farms by value of products sold - 1974 - north central region.

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| | VALUE OF PRODUCTS SOLD | | |
|---|---|---|---|
| | Under $2,500 | $2,500--$40,000 | Over $40,000 |
| | Pct. Total | Pct. Total | Pct. Total |
| Ohio | 23.7 | 59.2 | 17.1 |
| Michigan | 27.2 | 57.7 | 15.1 |
| Indiana | 19.3 | 59.5 | 21.2 |
| Illinois | 12.0 | 54.2 | 33.8 |
| Wisconsin | 16.3 | 64.8 | 18.9 |
| Minnesota | 12.8 | 60.9 | 26.3 |
| Iowa | 7.1 | 52.1 | 40.8 |
| Missouri | 28.8 | 57.8 | 13.4 |
| Kansas | 12.7 | 61.6 | 25.7 |
| Nebraska | 7.4 | 57.7 | 34.9 |
| S. Dakota | 6.8 | 64.3 | 28.9 |
| N. Dakota | 4.7 | 61.2 | 34.1 |

From a manpower and training standpoint farming is a moonlighting occupation for a numerical majority of those the census classifies as being "farmers". They have contributed an important part of the labor force employed by those industries which have originated in, or moved to the non-metropolitan part of the region in recent years. Also of very great importance is the number of smaller farms which survive because the farm wife is employed full or part-time off the farm. Farm women have entered the labor force during the 1970's in numbers equal to or greater than their urban and suburban counterparts.

Of some pertinence in analyzing the pattern of employment in the region is the extent of trade union membership and the variation in membership across the states. As may be noted from Table 9 union membership, as would be expected, is greatest in the more industrial states of the region. Ohio, Michigan, Indiana, Illinois, Wisconsin and Missouri - all rank above the national average in trade union membership for both 1964 and 1976. However the rate of decline in union membership during that 12-year period also exceeds the U. S. rate of decline. There is some public perception in states that have not had high union membership that union membership is increasing; however the data included in Table 13 does not support that contention. All states in the region have experienced a decline in membership although the rate of decline between states varies significantly.

TABLE 9. Labor union membership - 1964 - 1976 - non-agricultural workers - north central region

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| | PERCENT OF EMPLOYMENT | | |
|---|---|---|---|
| | 1964 | 1976 | Change |
| U.S. | 29.5 | 24.8 | -.4.7 |
| Ohio | 36.7 | 31.5 | - 5.2 |
| Michigan | 42.7 | 32.7 | -10.0 |
| Indiana | 36.4 | 30.7 | - 5.7 |
| Illinois | 38.4 | 32.2 | - 6.2 |
| Wisconsin | 33.4 | 29.4 | - 4.0 |
| Minnesota | 34.0 | 25.3 | - 8.7 |
| Iowa | 22.6 | 18.5 | - 4.1 |
| Missouri | 37.9 | 31.8 | - 6.1 |
| Kansas | 18.6 | 15.0 | - 3.6 |
| Nebraska | 19.2 | 15.2 | - 4.0 |
| S. Dakota | 10.0 | 9.6 | - 0.4 |
| N. Dakota | 14.8 | 12.1 | - 2.7 |

Distribution of Income

In contrast to other regions there is comparatively little rural poverty in the north central region. A recent USDA publication on social indicators (Peggy Ross, et. al.) includes socio-economic data for all counties in the U.S. According to that publication the north central region has only 49 of the 1,054 counties having a socio-economic status score more than one standard deviation below the mean for the country. Of those 40 counties all but two have a county population of more than 25,000 meaning that virtually all low income counties in the region are rural. Three states - Indiana, Iowa and Kansas - have no counties with a socio-economic index more than 1 standard deviation below the national mean. Of the 49 low income counties Missouri with 20 has by far the largest number followed by South Dakota with 12.

Age of the Population

Largely because of the extensive outmigration of young adults from agriculture and small towns over the years, the more agricultural north central states have become commonly perceived as heavily populated by a residual older population. While this is true to some extent the range of variation is not very wide. Michigan has the lowest percentage of it's population over 65 (9.3% while Iowa and Missouri share the highest percentage (13.0%). There is not however, a clear reciprocal relationship between the percent over 65 and the percent of the population under 20. For example, North and South Dakota have relatively high percentages of their population in both the under-20 and the over-65 categories. While there is some variation among the states in the percentage of the population under 20, it is not a sufficiently wide range to be very important from a program or policy point of view.

Education

The states in the region vary widely in their commitment of public funds to education. In 1977 for example the states in the region allocated the following amounts to education:

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Table 10. State support of elementary and secondary education

| | total (billions of $) | Per capita |
|---|---|---|
| Ohio | $2.548 | $238 |
| Michigan | 2.885 | 316 |
| Indiana | 1.407 | 264 |
| Illinois | 3.104 | 276 |
| Wisconsin | 1.438 | 309 |
| Minnesota | 1.748 | 440 |
| Iowa | 1.004 | 349 |
| Missouri | 1.026 | 214 |
| Kansas | .676 | 290 |
| Nebraska | .331 | 212 |
| South Dakota | .155 | 225 |
| North Dakota | .233 | 357 |

The difference in per capita commitment between the top state Minnesota and the bottom states Missouri and Nebraska is more than double. The relative commitment to education seems not to be related to other socio-economic or demographic characteristics of the states. This exemplified by Ohio, which is the most urbah and industrial of the corn belt states, being one of the lower ranking states in commitment of funds to education while North Dakota and Iowa which are two of the most rural have relatively high levels of commitment. This is further exemplified by the difference between the adjoining states of North and South Dakota which are very similar economically and demographically. The difference between those two states is nearly as great as the extremes.

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Table 11. Total expenditures/student 1976-77

| | Total | Current Operations |
|---|---|---|
| Ohio | $ 1554 | $ 1435 |
| Michigan | 2035 | 1814 |
| Indiana | 1552 | 1353 |
| Illinois | 2075 | 1759 |
| Wisconsin | 1917 | 1776 |
| Minnesota | 2012 | 1805 |
| Iowa | 1820 | 1677 |
| Missouri | 1484 | 1375 |
| Nebraska | 1685 | 1614 |
| South Dakota | 1499 | 1334 |
| North Dakota | 1632 | 1453 |
| U.S. Average | 1816 | 1638 |

As noted in the discussion of the age distribution of the population, the states vary little in the proportion of school age population. Similarly, there is little difference among the states in the proportion of that population enrolled in school.

The states do vary widely in the average number of students attending the operating districts. This however is not very informative since it reflects primarily the differential population density of the states within the region. The states with the largest population clearly have the largest number of students per operating district. An exception is Nebraska which has not consolidated schools to the extent that other states in the region have. The data are reported in Table 12.

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TABLE 12. Operating schools and enrollment by states - 1978

| | Number of School Systems | Avg. No. Students Per Operating System |
|---|---|---|
| Ohio | 615 | 3,418 |
| Michigan | 576 | 3,328 |
| Indiana | 304 | 3,650 |
| Illinois | 1,011 | 2,013 |
| Wisconsin | 427 | 2,075 |
| Minnesota | 440 | 1,835 |
| Iowa | 447 | 1,272 |
| Missouri | 555 | 1,621 |
| Kansas | 307 | 1,412 |
| Nebraska | 1,077 | 276 |
| S. Dakota | 186 | 743 |
| N. Dakota | 304 | 401 |

School busing and transportation have become an increasing part of the educational enterprise in the United States. For some of the more sparsely populated states in the region this means a commitment of a significant part of the education dollar to transportation. Nebraska and North Dakota are spending the most per student for transportation although they are transporting a realitvely smaller percentage of the total students than many other states in the region. While the concept of providing free transportation to many students has become firmly imbedded in American educational philosophy and has facilitated extensive consolidation of schools in rural areas, it is likely that that philosophy will come under more careful review as energy costs rise and claim a larger part of the educational dollar. This is the more likely as other educational costs rise, enrollments decline in many areas and the increasingly skeptical "taxpayer" reacts to those costs. As will be discussed later, this may produce some impact on vocational education which in rural areas is provided significantly by area vocational schools.

Vocational education in the north central region

Reliable data sources on the type and extent of vocational training especially for rural areas are difficult to find. There have been several conferences on rural education in recent years which have called for data on rural schools to be reported . At this time the best potential source of data on rural education is to be obtained from the various state departments of education. Later in this report an analysis of vocational education in Missouri will be presented.

There has been a national trend toward increasing emphasis on vocational education at all levels. Vocational education during the 1960's and 70's has come to be viewed not only as a component of educational policy but also as a major feature of national manpower and economic development policy. For example in 1970 vocational-technical education represented 17.4 percent of total federal outlays supporting education in educational institutions; by 1978 this had risen to 27.8 percent of the total.

Table 13 reports the enrollment by north central state in federally aided vocational programs for 1978 by various categories. The reported categories include from 51 percent of total vocational enrollment in Ohio up to 93 percent of the reported total for South Dakota. The reported categories represent 71 percent of the national total enrollment. One observation to be made from the data concerns the extent of variation among the states in enrollment in various categories. For example Home Economics ranges from a low of 16 percent of total vocational enrollment in Illinois to a high of 53 percent in South Dakora. There is a similar wide variation among the other categories by state.

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Table 13. Federally Aided Vocational Programs Enrollment - 1978

| | Total | Home Economics | | Office Occup. | | Trade Indust. | | Agri-culture | |
|---|---|---|---|---|---|---|---|---|---|
| Ohio | 803 | 169 | 21.0% | 58 | 7.2% | 148 | 18.4% | 42 | 5.2% |
| Mich. | 380 | 143 | 37.6% | 70 | 18.4% | 101 | 26.6% | 16 | 4.2% |
| Ind. | 196 | 56 | 28.6% | 26 | 13.3% | 61 | 31.1% | 24 | 12.2% |
| Ill. | 721 | 112 | 15.5% | 238 | 33.0% | 225 | 31.2% | 34 | 4.7% |
| Wisc. | 343 | 72 | 21.0% | 90 | 26.2% | 104 | 30.3% | 35 | 10.2% |
| Minn. | 439 | 133 | 30.3% | 53 | 12.1% | 95 | 21.6% | 55 | 12.5% |
| Iowa | 313 | 117 | 37.4% | 29 | 9.3% | 40 | 12.8% | 40 | 12.8% |
| Mo. | 232 | 87 | 37.5% | 29 | 12.5% | 40 | 17.2% | 22 | 9.5% |
| Ks. | 115 | 49 | 42.6% | 13 | 11.3% | 23 | 20.0% | 11 | 9.6% |
| Neb. | 101 | 43 | 42.6% | 15 | 14.9% | 16 | 15.8% | 11 | 10.9% |
| S.D. | 30 | 16 | 53.3% | 2 | 6.7% | 4 | 13.3% | 6 | 20.0 |
| N.D. | 60 | 17 | 28.3% | 7 | 11.7% | 8 | 13.3% | 9 | 15.0% |
| Region | 3,733 | 1,014 | 27.2% | 630 | 16.9% | 865 | 23.2% | 305 | 8.2% |
| National | 16,705 | 4,119 | 24.7% | 3,312 | 19.8% | 3,403 | 20.4% | 1,007 | 6.0% |

Of particular interest to this report is the enrollment in vocational agriculture. Various sources differ slightly on national enrollment, but an average of those sources corresponds with the data reported in the following table. There are a little over 1 million students enrolled in vocational agriculture. For the region this represents about 8 percent of total vocational enrollment while for the nation it approximates 6 percent. There is an expected variation among the states in the relative proporation of vocational enrollment to be found in agriculture. The three most industrial states in the region have about 4-5 percent of their total vocational enrollment in agriculture while the more agricultural states include 10 percent or more in that category.

There are several important implications of vocational agriculture for the future of vocational training in rural areas. These will be a topic of further discussion later in the report. An irony worthy of further comment is the extent of enrollment in vocational agriculture in relation to potential opportunities in farming. It is highly unlikely that more than 5 percent of vocational ag. students will become commercial farmers. Yet the number of students in vocational agriculture continues to increase. Our data suggest that vocational ag. enrollment has increased by approximately 20 percent during the 1970's while the number of commercial farmers has continued to decline.

Implications of social, economic and demographic changes for rural vocational education

For the foreseeable future it must be assumed that a majority of rural students receiving vocational training in the middlewest will, either by desire or necessity, leave their home area and the area in which they received their training for employment. There has not been sufficient rural industrialization or population "turnaround" to provide employment for all the young people who might choose to remain there. Even if there were sufficient employment, repeated studies of educational and occupational aspirations of rural youth show that a majority want to leave the community in which they were raised although that percentage has been declining in recent years.

In addition the underlying assumptions of most vocational training - to train students for a "mass" national labor market into which they will enter by becoming employees of some large scale bureaucratic organization -- will probably continue to be the most satisfactory and successful orientation for a majority of students. That is how, through some set of usually unpredictable circumstances, most will in fact enter the labor market. Such an orientation requires that students be geographically mobile and that they have been socialized to apply their skills in a complex organization whose name they have quite probably not heard of until they accept employment with the firm. Once these workers have demonstrated their geographic mobility they will most likely be called upon to exercise it frequently as their welding job moves from one site to another.

While the above will undoubtedly continue to be the pattern of the "one best system" of vocational training through the 1980's, some of the following sections will be directed toward identifying those economic opportunities and circumstances for which the products of the above system don't fit well and the students who don't belong to the majority described above.

Before doing so however, some general comments will be offered concerning prospective trends in the north central region and what these may mean from a macro employment point of view.

1. As alluded to elsewhere in the report, the north central region, long an industrial core of the U.S., will probably diminish in the relative proportion of national industrial output located within the region. It can be expected that more of the manufacture and assembly of goods will move toward the south and the west. Certainly there is evidence that two of the major prospective growth industries of the 1980's - electronics and energy - are either well established in the south and west or they are moving in that direction. In addition, since the population is moving noticeably in those directions, it can be expected as well that certain consumer goods manufacturers such as automobile assembly are likely to relocate closer to centers of population density. It is probable that trends that seem already in place such as the notable decline in population of older industrial centers in the eastern corn belt will continue on into the 1990's. Unemployment in the region can perhaps be assumed to surpass the national level of unemployment over the next several years. The rate of economic growth of the region is likely to be surpassed by the national growth rate.
2. It is probable that existing trends in agriculture will continue e.g. existing commercial farms are likely to continue to increase in size although the rate of increase is likely to diminish both because of high land values and because of hearing the point of diminishing returns with regard to size with existing technology.

   The trend toward more smaller hobby or second-income farms is likely also to increase. The small farms with relatively few exceptions will serve primarily as a place to live and as a source of supplementary income.

The small farms will relatively few exceptions will serve primarily as a place to live and as a source of supplementary income. The operator and spouse are likely to be employed full-time off the farm or retired and receiving various forms of retirement income. Small farms will therefore be most concentrated in areas close to sources of non-farm employment and/or attractive retirement areas. The growth in number of such farms is also most likely to occur in those parts of the region least suited to large scale commercial agriculture such as northern Minnesota, Wisconsin, Michigan and southern Ohio, Indiana, Illinois and Missouri. These "refuge" farms are likely to contribute to continued increases in the population of urban fringe and rural counties where they are most prevalent while the continued expansion in size of commercial farms is likely to lead to even further reductions in population in major parts of rural Kansas, Nebraska, Iowa and North and South Dakota. In general it is our judgment that the trends that have begun in the 1970's are likely to continue throughout the 1980's and at about the same rate.

3. With regard to the cities of the region, it is our expectation that the population of the central cities will continue to decline for a few more years before they level off and begin to increase again. It is our expectation that the northern industrial cities have reached or surpassed their peak in terms of proportion of black population and other minority population.

We expect also that unless there is some major policy-imposed condition, such as severely restricted gasoline rationing, that the emergence of geographically large regional cities will continue. We expect commuting to continue and at the same time for many firms to establish operations further removed from the old down-town areas.

We also expect to see the major growth within the region during the coming decade occurring in some of the smaller cities and metropolitan

areas such as the Guad Cities of Iowa and Illinois, Lincoln, Nebraska; Springfield, Missouri; Columbia, Missouri; etc. We expect this both because of evidence that smaller cities are increasingly perceived to be desirable places to live, and the movement of industries which are not significantly dependent on raw materials toward such smaller cities.

One implication of the above observations for vocational education is that there is likely to be greater difficulty in the future in placing graduates of the vocational schools within the region. Another implication is that vocational schools may need to become more committed to continuing education and vocational retraining. Certain fields such as nursing, accounting, auto repair, energy engineering, etc. are likely to be greatly influenced by new technologies during the coming decade contributing to a rising demand for continuing education and retraining. It is assumed that training for new entrants will keep abreast of such probable technological shifts.

4. The preceding analysis of the region has been intended to call to attention two factors we consider to be important to planning to meet rural vocational education needs. The preceding information shows the midwest to be a very diverse region from the standpoint of its economic base and its rural population. In our judgment future planning needs to take greater cognizance of the diversity of rural Circumstances.

In addition we have reported that on a number of major factors important changes are continuing to occur within the region. Some of these changes such as decline in the number of commercially significant farms are in keeping with past trends. How ever other changes such as the decline in the population of central cities, the very modest rates of population increase in the metropolitan areas, and the important increase in rural population in many parts of the region represent an important departure from part trends.

Perhaps the most significant change from the recent past is the uncertainity regarding price and availability of energy. Rural populations are especially dependent on energy and private transportation in obtaining even the most basic services . The past has produced significant centralization and consolidation of rural services including especially education and more particularly vocational training with little attention to the cost of transportation to reach those services. An important question to be confronted in the 1980's will be the intent to which rural people will move closer to sources of employment and services or whether means will be developed to economically mobilize services or change the method of providing them to overcome the costs of space .

The above discussion has been addressed to some general trends and issues which will have a bearing on the provision of vocational training in the region. The remainder of the discussion will be directed toward more specific implications of these trends for rural vocational training. We submit that rural communities represent overlooked opportunities for employment and for experimenting with realistic alternative methods of providing appropriate and relevant preparation for the world of work and employment. It is to those opportunities that the remainder of the discussion is addressed.

Opportunities in Rural Vocational Education

In order to determine more fully the implications of change for rural vocational education it is necessary to move to a level of analysis below that of a state. As we have already noted not only is there significant diversity between states but also within the various states. Capturing that diversity and better understanding the factors contributing to change requires more variables and attention to the direction and magnitude of their change at a minimum of a county level - a community

level would be preferable but is not possible because of the lack of data.

For purposes of developing implications for rural vocational education we move now to a more detailed analysis of rural Missouri and the changes which have occurred there during the 1970's. The rationale for choosing Missouri is two-fold. First and foremost it is the state with which the author is most familar and for which we have the greatest amount of detailed information. Secondly Missouri represents greater social, cultural, demographic and economic diversity than any of the other states in the region. The following map which delinates major cities and regions within the state illustrates some of that diversity.

In extreme southeastern Missouri is a six-county area known generally as the Missouri Bootheel. This area, largely because of its proximity to the Mississippi River and its topography, became agriculturally significant as a cotton growing region, spawning at the same time many of the socio-cultural forces which characterized the cotton south. Until the past decade cotton was the major crop and at least prior to 1950, the economy was characterized by a large field-labor black population. Although cotton has diminished in importance to the local economy, evidence of the day when cotton was king remains. There is a numerically significant and low income black population. Because the area has not industrialized to any great extent and because of the prevailing rural culture, the rate of outmigration of young adults, especially blacks, has been exceptionally high throughout the 50's and 60's and has continued on into the 70's. As described earlier, this area represents the major concentration of rural minority population in Missouri and one of the few areas of rural black population in the entire north central region.

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The region generally south of the Missouri River is widely known as the Missouri Ozarks. It is hilly and heavily timbered with forestry, beef cattle and feeder pig production being the major agricultural enterprises. If the Missouri Bootheel resembles the cotton south in most of its major features, the Ozarks most resembles Appalachia. Indeed, the area was generally populated in the early 1800's by migrants moving west from Appalachia. Largely because of the topography and the timber cover, agriculture is widely practiced but not on a large scale commercial basis. As mentioned earlier in this report, the Ozarks is typified by relatively small (80 - 160 acres) farms which, at prevailing market prices, are not sufficiently large or productive to sustain a family without supplemental income. Consequently virtually all the numerous farms in this region are "part-time" with farming being both an avocation and a means of accumulating savings and equity for the operator. The income to live is derived primarily from off-farm work in local, usually labor-intensive fabrication plants - shoe factories, sporting goods and ready-to-wear apparel plants are the most frequently encountered forms of industrialization within the area. These plants, howver, have labor forces which are often heavily populated by woman and wages are relatively low in contrast with those prevalent in metropolitan areas. Another major means of off-farm employment, depending in part on location, is commuting to work in one of the major employment areas. Springfield, Missouri, which has had the greatest population increase among the cities in the north central region, attracts its labor force from a labor market area which extends approximately 50 - 75 miles in each direction. The same thing is true of St. Louis. Many of the major employers in the St. Louis metropolitan area are located south and west of St. Louis, placing them in

relatively greater proximity to workers far into the Ozarks. As will be noted in our discussion of population shifts within the state, the rural counties experiencing the largest increase during the 1970's have generally been those within commuting distance of major employment areas. Two major additional sources of employment have had a significant influence on the Ozarks in recent years. One is an important increase in lead mining in the south east central Ozarks. Since these mines are relatively large and operated by major companies, wage rates are relatively high for the area, and they are technologically advanced. As a consequence, they too attract a labor force from many counties around. Other sources of local indigenous employment include a timber industry characterized by many small operators and relatively low levels of technology in logging and cutting of charcoal wood. The quality of the timber is relatively low, consequently a majority of the wood processors are devoted to production of staves for barrels, charcoal and pallets. They depend primarily on local small scale wood cutters for their raw material. In addition the Ozarks has become an attractive area for many seeking a moderately inexpensive rural environment for retirement. This phenomena coupled with an increase in tourism has contributed to an increase in service-based employment in the region during recent years.

The Ozarks, similar to Appalachia, is an area virtually devoid of minority populations. The culture is characterized by individualism and relatively modest aspirations in comparison with the rural areas of Iowa, Illinois, Wisconsin, etc. which were populated largely by relatively later arriving northern European immigrants.

The Missouri River which runs between Kansas City and St. Louis basically forms the southern boundary of the corn belt. North of the Missouri River commercial agriculture predominates although the land is of lower quality and

consequently farms somewhat less productive than in Iowa and Illinois. Northern Missouri however conforms generally to the characteristics associated with the corn belt. Because of extensive agricultural mechanization, it has been an area of heavy outmigration of young adults throughout this century. Most counties in the area reached their peak in population circa 1900. As a result of long term outmigration, the towns of the area have lost services over a period of time and many small towns which existed to serve the needs of farmers in an era of less mobility have either declined or died out. As will be noted later in our report, there is evidence now that this pattern has begun to change, both demographically and economically. Like many other similar areas in the north central region, there has been some degree of rural industrialization. In the western part of northern Missouri, there is clear evidence of a labor market impact of Kansas City. Similar to the effect noted with regard to St. Louis and Springfield, it is quite clear that the Kansas City economy has extended out 50 or more miles during this decade. Aside from Columbia, which is located equi-distant between Kansas City and St. Louis, there is no other town north of the Missouri River with a population in excess of approximately 15,000. Each of the larger towns in that region can best be described as rural trade centers with the possible exception of Kirksville (population approximately 15,000) which is the location of the Kirksville College of Osteopathy (Osteopathic medicine has always been important in rural Missouri) and Northeast Missouri State University. These combine to add to the economic base of that region, an effect which is noted in a population increase for Kirksville and surrounding counties despite the importance of agriculture to the regional economy.

Added to the rural diversity of Missouri is a distinct difference in the character and economy of the two major cities - St. Louis and Kansas City. Kansas City is to a significant extent predicated on serving the agricultural region surrounding it, while the economic history of St. Louis has its roots in the early river trade and being the cultural center for the "West." A majority of the major economic enterprises in the Kansas City area are concerned with agribusiness while in St. Louis the dominant businesses are Anheuser-Busch, Monsanto Chemical and McDonnel-Douglas aircraft in addition to plants of the big three automakers.

Somewhat important to the economy of rural Missouri is the fact that both the major metropolitan areas are located on the border of the state, thus making their influence somewhat less than if they were more centrally located. Each of the cities, reflected through the emphasis in their newspapers, plays the role more of an interstate regional center than a state-oriented city.

Vocational education in Missouri

Missouri has 555 operating school districts of which 455 are operating high schools. As may be notes from Table 13, most high school districts are offering at least industrial arts but after that the percentage offering various vocational courses declines rapidly. There are 59 designated area vocational schools offering secondary and post-secondary serving the needs of Missouri's 115 counties. Because there are multiple schools in Kansas City and St. Louis, this reduces to 55 different counties having one or more schools. The geographic distribution of the counties having an AVS is indicated on the following map. There are no counties in the state which are not adjacent to a county having a designated AVS. However given the average size of Missouri counties (approximately 25-30 miles per side) this still places the student population of at least half the counties at a locational disadvantage.

Although transportation and overcoming distance is not the only contributing factor, two previous studies[1/] in Missouri have shown that students who do not attend an AVS host district have a significantly lower probability of attending an AVS than students from the host district. As an example, we have data from three schools in the south central Ozarks over the past several years which reveal the inability of the Area Vocational Schools to meet the full potential demand for vocational training. Each of the three high schools (located in Dent, Crawford and Washington counties) typically have only about 1/4 to 1/3 of their students go to college or other post-secondary education.

1/ Lynch, Harold E. Factors Influencing Enrollments of Students from Participating School Districts in Missouri Area Vocational Schools. Unpublished Ph.D. dissertation, University of Missouri-Columbia 1974, and Orville Adams. Program Analysis of Missouri 3A Schools. Unpublished report. Flat River, Missouri School System.

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TABLE 13. Vocational education in MIssouri - 1979

| Vocation | No. Districts Offering | % of Districts | No. of Students | Students/ District |
|---|---|---|---|---|
| **SECONDARY** | | | | |
| Agriculture | 239 | 52.5% | 16,574 | 69.3 |
| Business & Office | 266 | 58.5% | 13,210 | 49.7 |
| Distributive Ed. | 101 | 22.2% | 12,353 | 122.3 |
| Health | 59 | 13.0% | 1,421 | 24.1 |
| Home Ec (Consumer) | 362 | 77.4% | 82,102 | 226.8 |
| Home Ec (Occ.) | 27 | 5.9% | 1,646 | 61.0 |
| Trade & Tech. | 148 | 32.5% | 22,278 | 150.5 |
| Industrial Arts | 413 | 90.8% | 140,509 | 340.2 |
| Guidance | 297 | 65.3% | 0 | |
| **POST-SECONDARY** | | | | |
| Agriculture | 13 | | 730 | 56.2 |
| Business & Office | 23 | | 7,266 | 315.9 |
| Distributive Ed | 16 | | 1,912 | 119.5 |
| Health | 19 | | 2,600 | 136.8 |
| Home Ec (Consumer) | 4 | | 0 | - |
| Home Ec (Occ) | 15 | | 1,802 | 120.1 |
| Trade & Tech. | 19 | | 7,061 | 371.6 |
| Industrial Arts | 0 | | 0 | |
| Guidance | 15 | | 0 | |
| **ADULT** | | | | |
| Agriculture | 119 | 26.2% | 5,035 | 42.3 |
| Business & Office | 59 | 13.0% | 8,408 | 142.5 |
| Distributive Ed | 13 | 2.9% | 1,141 | 87.8 |
| Health | 40 | 8.8% | 5,387 | 134.7 |
| Home Ec (Consumer) | 20 | 4.4% | 4,613 | 230.7 |
| Home Ec (Occ.) | 13 | 2.9% | 1,934 | 148.8 |
| Trade & Tech. | 53 | 11.6% | 30,404 | 573.7 |
| Industrial Arts | 0 | - | 0 | - |
| Guidance | 1 | 0.3% | 0 | - |
| **TOTAL** | | | | |
| Agriculture | | | 22,399 | |
| Business & Office | | | 28,884 | |
| Distributive Ed | | | 15,406 | |
| Health | | | 9,408 | |
| Home Ec (Consumer) | | | 86,715 | |
| Home Ec (Occ.) | | | 5,382 | |
| Trade & Tech. | | | 59,743 | |
| Industrial Arts | | | 140,509 | |
| Guidance | | | - | |

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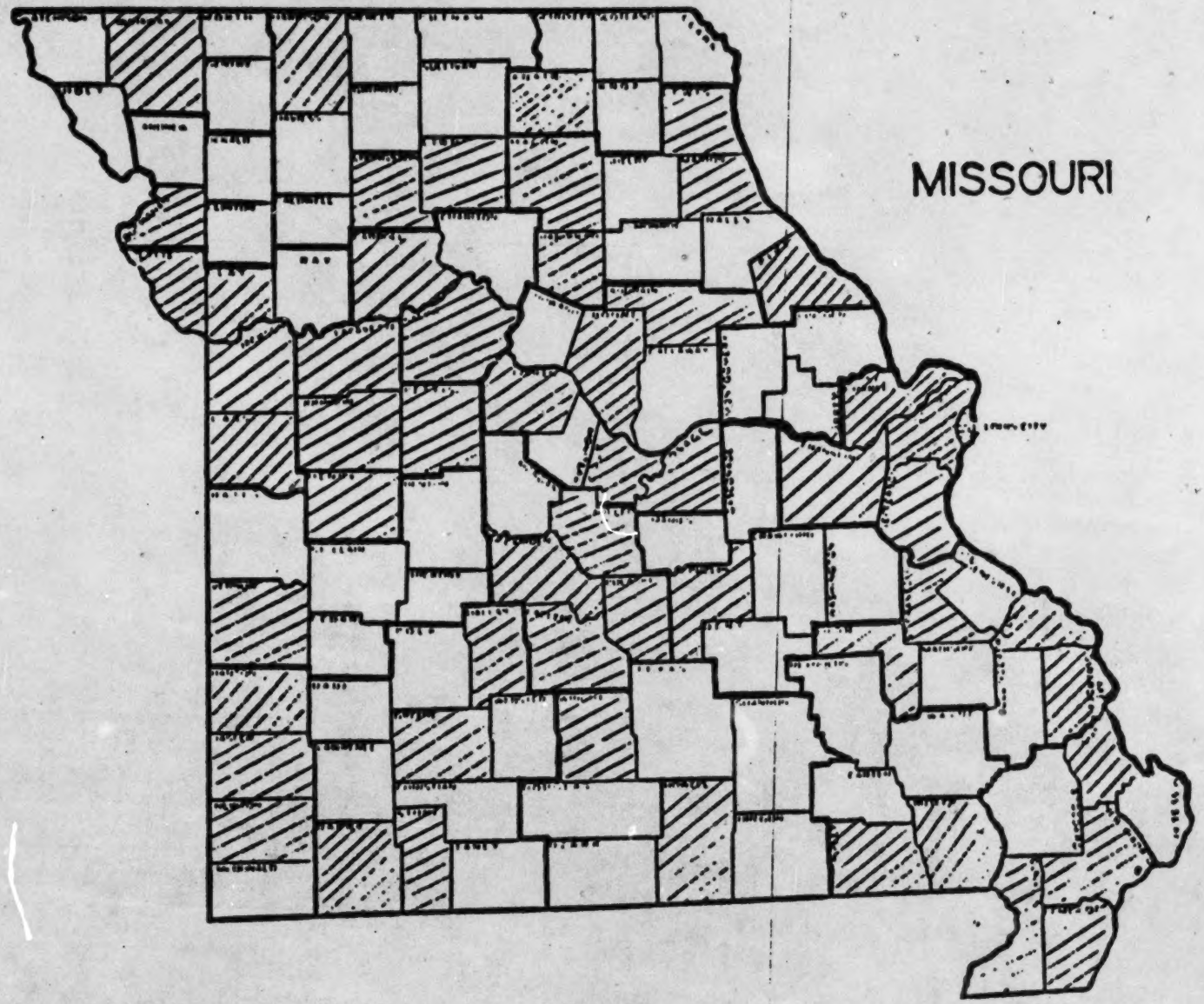
Counties having one or more Area Vocational School



This seems about average for schools in that part of the state. One of the high schools having an average of about 150 students graduating per year, is able to send only about 30 students to the AVS - because of space available in the AVS and the financial limitations of the school district. The AVS is 30 miles away and represents an additional significant cost to the school in providing regular transportation. Each of the three schools is in agreement that the AVS is doing an excellent job for those students they are able to send, but that it is not sufficient to meet the needs of their student body and/or community. Consequently they feel they must take some initiative on their own to more effectively serve the needs of their vocationally-oriented students. We will discuss this problem further in the section on implications.

In 1979 there were 368,446 students enrolled in vocational courses in the state of which 290,093 (78.7%) were enrolled in secondary school, 21,371 (5.8%) were enrolled in post-secondary and 56,922 (15.4%) were enrolled in adult occupational education courses. These numbers are misleading however because they include industrial arts and beginning home economics classes which are at best pre-vocational training. If industrial arts and consumer home economics are excluded, then the largest categories of trainees are in trade and technical (59,743) of which more than 50 percent are adult trainees; business and office (28,884): and vocational agriculture (22,399). Distributive education which can cover a wide variety of skill areas claims an additional 15,406 students.

As may be noted from Table 13, there are nearly 70 different courses that are offered as a part of trades and industry training. However, of these, 27 or about 40 percent, had fewer than 100 students enrolled during 1979. The most popular trades and industry courses were auto mechanics I and carpentry I. Each of these claimed nearly 10 percent of total trades and industry enrollment. There were also large enrollments in vocational preparation and various forms of employer-trainee cooperative programs.

In addition to the trades and industry courses, the remaining "vocational" courses offered at the secondary school level most often emphasize pre-vocational skills in business education, home economics, industrial arts and agriculture. Typing, bookkeeping, family meals, general woodwork and farm management represent by far the greatest student enrollment.

The data included in Table 14 demonstrate also the uneven access to various levels of vocational education available to secondary school students in the state. There is only one course which is offered in all secondary schools (typing I). As an indication of the differential availability of vocational training, Table 14 lists 203 different courses being offered by Missouri secondary schools. Of these 203, only 18 -- or less than 10 percent -- of the courses are being offered by even 50 percent of the schools. Conversely 131 of the 203 courses are being offered by fewer than 50 of the 455 secondary school districts in the state. Therefore although the list of courses and occupations for which they might prepare students is impressive, students of the vast majority of Missouri secondary schools do not have access to them. Accessibility is not likely to be improved without some serious attention to the mechanisms through which vocational training is offered and made available.

The primary means through which rural students gain some access to a broader and more sophisticated array of vocational training opportunities is through the area vocational schools. As an example of the range of offerings of these schools and their performance, data were assembled from one relatively rural area vocational school for the 1977-78 and 1978-79 school years. The school is located in the Missouri Ozark region in a town of about 14,000 population and serves all or parts of five counties. Some pertinent data for this school are reported in Table . For both secondary and post-secondary graduates of the program, about 70 percent of those available for employment following graduation were employed as trained. Of the total graduates of both programs, about 20 percent were not

Table 14.
Vocational courses and enrollment in Missouri secondary schools - 1979

| Courses | Districts Offering | Pupils Enrolled |
|---|---|---|
| **Agriculture:** | | |
| General Agriculture | 8 | 231 |
| Vocational Agriculture I | 34 | 965 |
| Vocational Agriculture II | 31 | 615 |
| Vocational Agriculture III | 19 | 296 |
| Vocational Agriculture IV | 17 | 199 |
| Animal Science | 197 | 4,616 |
| Livestock Production and Marketing | 130 | 1,825 |
| Agricultural Structures | 100 | 1,440 |
| Farm Management | 109 | 15,210 |
| Agricultural Sales and Service | 25 | 301 |
| Agricultural Business | 19 | 238 |
| Agricultural Power I | 101 | 1,288 |
| Agricultural Power II | 38 | 772 |
| Agricultural Machinery | 67 | 898 |
| Agricultural Surveying and Water Management | 20 | 290 |
| Plant Science | 191 | 3,699 |
| Crop Production and Marketing | 74 | 911 |
| Forestry and Conservation | 7 | 143 |
| Horticulture | 38 | 842 |
| Landscaping | 2 | 21 |
| Agricultural Construction | 161 | 2,814 |
| Agricultural Chemicals | 3 | 30 |
| Supervised Occupational Experience | 66 | 974 |
| Pre-Vocational Agriculture | 2 | 83 |
| Other Vocational Agriculture | 29 | 858 |
| | 1,458 | 39,039 |
| **Business Education:** | | |
| Basic Business I | 344 | 19,901 |
| Basic Business II | 61 | 2,319 |
| Business Administration | 28 | 831 |
| Data Processing | 39 | 1,515 |
| Bookkeeping/Accounting I | 436 | 20,825 |
| Bookkeeping/Accounting II | 88 | 2,919 |
| Business English | 78 | 1,880 |
| Business Law | 166 | 7,843 |
| Business Math | 96 | 4,063 |
| Clerical Practice I | 258 | 6,901 |
| Clerical Practice II | 90 | 1,784 |
| Consumer Economics | 43 | 2,797 |
| General Office Training | 61 | 2,785 |
| Law & Everyday Living | 6 | 246 |
| Note Hand | 35 | 1,276 |
| Office Machines | 38 | 3,526 |
| Business Specialties | 12 | 370 |
| Recordkeeping | 68 | 4,781 |
| Retailing | 13 | 537 |
| Salesmanship | 22 | 647 |
| Secretarial Practice I | 180 | 9,782 |
| Secretarial Practice II | 60 | 980 |
| Shorthand I | 377 | 20,545 |
| Shorthand II | 14 | 487 |
| Supervised Office Experience | 64 | 1,881 |
| Pre-Vocational Business | 11 | 456 |
| Typing I | 454 | 26,704 |
| Typing II | 252 | 20,197 |
| Key Punch | 7 | 849 |
| Other Business | 44 | 2,165 |
| | 3,444 | 164,366 |
| **Distributive Education:** | | |
| Distributive Preparation I | 80 | 5,535 |
| Distributive Preparation II | 8 | 825 |
| Distributive Education (COE) I | 169 | 8,033 |
| Distributive Education (COE) II | 97 | 1,380 |
| Supervised Employment | 125 | 8,578 |
| | 388 | 22,230 |

| Courses | Districts Offering | Pupils Enrolled |
|---|---|---|
| **Consumer Homemaking:** | | |
| Consumer Homemaking I | 403 | 15,657 |
| Consumer Homemaking II | 152 | 2,918 |
| Consumer Homemaking III | 45 | 821 |
| Consumer Homemaking IV | 13 | 79 |
| Contemporary Living | 171 | 6,389 |
| Family Living | 179 | 6,013 |
| Consumer Homemaking for Seniors | 28 | 831 |
| Consumer Education | 137 | 3,673 |
| Applied Home Furnishings | 22 | 613 |
| Creative Clothing | 184 | 5,183 |
| Child Development | 394 | 13,772 |
| Wardrobe Planning and Clothing Construction | 247 | 9,222 |
| Family Relations, Home Economics | 179 | 8,245 |
| Family Meals | 299 | 19,896 |
| Home Management | 83 | 906 |
| Home Nursing (Family Health) | 141 | 3,358 |
| Housing and Interior Design | 234 | 7,406 |
| Personal Culture | 161 | 5,071 |
| World Foods | 168 | 4,202 |
| Child,-Elderly,-Family Services | 9 | 302 |
| Clothing Management, Production and Services | 15 | 386 |
| Food Management, Production and Services | 26 | 1,216 |
| Home Furnishings, Equipment and Services | 3 | 62 |
| Institutional and Home Management Services | 2 | 24 |
| Orientation to the World of Work | 2 | 28 |
| Other Occupational Home Economics | 8 | 185 |
| Pre-Vocational Occupational Home Economics | 4 | 77 |
| Other Consumer Homemaking | 81 | 1,879 |
| | 3,222 | 118,813 |
| **Industrial Education:** | | |
| Industrial Arts | 12 | 1,436 |
| Power Mechanics-Power Technology | 96 | 6,238 |
| Aviation | 1 | 14 |
| Industrial Crafts | 71 | 4,399 |
| Industrial Ceramics | 2 | 30 |
| Industrial Plastics | 12 | 255 |
| General Drafting-Mechanical Drawing | 329 | 13,724 |
| Architectural Drafting | 88 | 1,961 |
| Machine Drafting | 19 | 344 |
| Technical Drafting | 16 | 824 |
| Electricity/Electronics | 112 | 5,887 |
| Exploratory Industrial Arts (General Shop) | 331 | 17,388 |
| Home Maintenance and Repairs | 67 | 2,797 |
| General Metalwork | 236 | 11,946 |
| Metal Machining (Machine Shop) | 16 | 750 |
| Sheet-Metal | 10 | 220 |
| Welding | 26 | 633 |
| General Woodwork I | 262 | 13,079 |
| General Woodwork II | 123 | 4,388 |
| Wood Machining | 60 | 2,404 |
| Wood Technology | 34 | 1,077 |
| Pre-Vocational Industrial Arts | 10 | 314 |
| Printing | 13 | 1,444 |
| Photography | 14 | 1,225 |
| Other Industrial Arts | 26 | 1,883 |
| | 2,064 | 99,220 |

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| Courses | Districts Offering | Pupils Enrolled |
|---|---|---|
| **Technical:** | | |
| Scientific Data Processing | 9 | 651 |
| **Trades and Industry:** | | |
| Industrial Preparation | 22 | 686 |
| Industrial Cooperative Training | 48 | 2,321 |
| Supervised Industrial Employment | 60 | 3,196 |
| Vocational Preparation | 24 | 1,866 |
| Air Conditioning I | 27 | 475 |
| Air Conditioning II | 24 | 290 |
| Appliance Repair I | 4 | 101 |
| Appliance Repair II | 2 | 21 |
| Auto Body and Fender I | 41 | 1,066 |
| Auto Body and Fender II | 25 | 858 |
| Auto Mechanics I | 80 | 2,572 |
| Auto Mechanics II | 67 | 1,063 |
| Other Auto Service | 5 | 85 |
| Aviation Occupations I | 3 | 190 |
| Aviation Occupations II | 1 | 15 |
| Business Machine Maintenance I | 2 | 61 |
| Business Machine Maintenance II | 2 | 29 |
| Commercial Art Occupations I | 6 | 271 |
| Commercial Art Occupations II | 3 | 46 |
| Carpentry I | 114 | 2,228 |
| Carpentry II | 80 | 998 |
| Electricity I | 2 | 66 |
| Electricity II | 1 | 14 |
| Masonry I | 6 | 145 |
| Masonry II | 4 | 41 |
| Pipefitting and Plumbing I | 3 | 71 |
| Pipefitting and Plumbing II | 2 | 22 |
| Other Construction Maintenance Trades I | 8 | 157 |
| Other Construction Maintenance Trades II | 7 | 108 |
| Custodial Services | 2 | 20 |
| Diesel Mechanic I | 3 | 89 |
| Diesel Mechanic II | 2 | 26 |
| Drafting Occupations I | 23 | 451 |
| Drafting Occupations II | 22 | 332 |
| Electrical Occupations I | 8 | 263 |
| Electrical Occupations II | 3 | 62 |
| Electronic Occupations I | 42 | 925 |
| Electronic Occupations II | 26 | 461 |
| Fabric Maintenance Services | 2 | 136 |
| Graphic Arts Occupations I | 24 | 712 |
| Graphic Arts Occupations II | 19 | 330 |
| Maritime Occupations I | 1 | 9 |
| Maritime Occupations II | 1 | 3 |
| Machine Shop I | 30 | 881 |
| Machine Shop II | 15 | 344 |
| Sheet Metal I | 5 | 241 |
| Sheet Metal II | 3 | 47 |
| Welding I | 36 | 980 |
| Welding II | 29 | 490 |
| Metalworking I | 5 | 237 |
| Metalworking II | 1 | 17 |
| Cosmetology I | 4 | 168 |
| Cosmetology II | 3 | 90 |
| Other Personal Services | 1 | 20 |
| Quantity Food Occupations I | 6 | 209 |
| Quantity Food Occupations II | 2 | 38 |
| Refrigeration I | 1 | 20 |
| Refrigeration II | 1 | 14 |
| Small Engine Repair (Internal Combustion) I | 20 | 400 |
| Small Engine Repair (Internal Combustion) II | 8 | 129 |
| Textile Production and Fabrication I | 5 | 146 |
| Textile Production and Fabrication II | 2 | 84 |
| Leather Working | 1 | 32 |
| Woodworking Occupations I | 4 | 119 |
| Woodworking Occupations II | 3 | 83 |
| Other Trade and Industrial Occupations I | 11 | 812 |
| Other Trade and Industrial Occupations II | 2 | 31 |
| | 1,080 | 27,264 |

| Courses | Districts Offering | Pupils Enrolled |
|---|---|---|
| **Special Education:** | | |
| Severely Handicapped | 2 | 17 |
| Learning Disabilities | 240 | 5,357 |
| Remedial Speech | 368 | 13,473 |
| Speech & Language Developmental Disorders | 7 | 226 |
| Hard of Hearing | 17 | 253 |
| Mental Retardation (Educable) | 349 | 12,766 |
| Orthopedically Handicapped | 8 | 310 |
| Partially Sighted | 2 | 17 |
| Behavioral Disorders | 31 | 1,765 |
| | 824 | 30,174 |
| **Miscellaneous:** | | |
| Career Education | 36 | 2,127 |
| Cadet Teaching | 21 | 816 |
| Humanities | 22 | 1,478 |
| Library Science | 13 | 426 |
| | 92 | 4,847 |

available for employment following graduation. The armed forces and additional post-secondary education were the major claimants on those not available for employment. The AVS produced graduats in 17 areas of vocational training at the secondary level and 12 areas at the post-secondary level. The areas of secondary training with the best record of graduates employed as trained were masonry, COE, agriculture, automotive technology and cabinet making, all with 75 percent or more of graduates being employed as trained.

TABLE 15. Follow-up summary of rural Missouri Area Vocational School - secondary and post-secondary 1977-78, 1978-79

| | SECONDARY | | POST-SECONDARY | |
|---|---|---|---|---|
| | 1977-78 | 1978-79 | 1977-78 | 1978-79 |
| No. Graduated | 241 | 220 | 121 | 114 |
| Available for Employment | 192 | 164 | 101 | 96 |
| Employed as Trained | 72.5% | 70.6% | 70.0% | 75.4% |
| Percent Employed | 94.3% | 99.4% | 88.0% | 94.8% |

Also at the secondary level, the areas having the lowest placements as trained were accounting, air conditioning and refrigeration, drafting, and machine shop -- all with 50 percent or fewer being employed as trained.

At the post secondary level the highest proportion of placements as trained were air conditioning and refrigeration, auto body repair, dental assistants, machine technology, practical nursing, secretarial science and welding technology -- all with 75 percent or higher. Areas of low placement were accounting, cabinet making, and electronics. It is interesting that some areas of low placement among secondary graduates were areas of high placement among post-secondary and vice versa. An exception was accounting which had a low placement level at both secondary and post-secondary training.

## Factors and conditions influencing vocational education in rural areas

It has been emphasized that existing area vocational schools are performing a set of functions which are needed and for which there has been a heavy demand. It has also been emphasized however that they are insufficient to meet the training needs of the full cohort of rural students who have no aspirations for post-secondary education. We are going to assume therefore, as we did above, that the purposes being served by the area vocational schools will continue to be in demand (even if it means that graduates will need to be geographically mobile). We have further assumed that there will continue to be a mass, general, non-localized demand for most of the skills being taught by area vocational schools today. These two assumptions, however, leave unresolved the need for additional students to receive vocational training and the kind of training needed to effectively enter the labor force in rural areas where there is a demand for services which is not being met.

### Rural labor markets

It was noted above that additional rural industrialization and extensive commuting to areas of mass employment have captured much of the labor force residing in rural communities in Missouri. This coupled with the continued outmigration of some youth has contributed to the unemployment rate in most rural Missouri counties being relatively low.[1]

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[1] Unemployment like many other statistics is more meaningful and applicable when applied to urban areas than rural areas. Because of the more particularistic nature of employment in rural areas and the greater prevalence of self employment and irregular employment, the greater problem in rural areas appears to be under-employment. Thus far, no measure of under-employment has been devised which is sufficiently valid, reliable and collectable to enter in the Bureau of Labor Statistics reporting system. A consequence is that most rural areas traditionally report low unemployment unless they have become dependent on one or more large scale employers who either lay people off or close a plant.

In a following section, however, we will identify certain areas of economic opportunity for which there seems to be a consumer demand which are not being met. These seem to have the potential for creating additional placements in rural areas but present methods of training appear to limit this potential.

Current methods of vocational training and instruction rely heavily on in-school training personnel providing training for an economically feasible number of students at a time. Under this method, the capacity of a small labor market to absorb this class is limited, leaving as a consequence the students to either migrate from the area or not make labor market use of the skill they have acquired. The problem stated simply, is that small labor markets often are characterized by having nearly as many skills represented in them as large labor markets; there are just not as many of each. Consequently the current approach of providing a relatively large number of students with a relatively few skills does not meet the diversified needs of smaller labor markets. Oversimplified the matching problem is that small labor markets need many different skills but not many of each, while our vocational programs are not oriented toward producing a relatively large number of students in a relatively small number of skill areas for a mass market. This is the only economically feasible alternative given the methods of training we employ. That "job" and "class" orientation of vocatinal training obviously limits the extent to which traditional vocational training programs can be responsive to local needs, and limits as well the number of students that can be ethically and economically trained. No one would argue the negative consequences of training everyone to be an auto mechanic just for the sake of offering vocational training to the non-college bound student.

Many of the more interesting and remunerative careers in rural communities are ones for which there are no vocational training programs because there is no mass market for the skill. Examples include cattle buying, parts specialist at the farm machinery dealership, farm real estate appraisal, management personnel

of local farm supply businesses and/or cooperatives, lumber broker, constructing farm terraces and ponds, small contractor, auctioneer, etc. There are many others which could be listed, all of which involve a skill but which are not amenable to being taught through existing vocational training programs. People wander into these kinds of careers now mostly becuase of very particularistic and unique circumstances - usually they acquire the skill through the equivalent of an apprenticeship. While the above kinds of careers do not lend themselves to traditional vocational training methods and concepts, we would suggest that public school systems could play a role in identifying students having an interest in such fields and also in providing a connecting link for establishing a system of apprenticeship training which could be performed using community resources. In Missouri we have been experimenting with a concept we have referred to as "contract vocational education" which has as its basic feature the provision of apprenticeship training with the trainers being community residents and employers who have skills for which there is a demand and no existing vocational training program. This experiment has been effective in gaining communtiy acceptance and has resulted in a high proportion of job placements. It can by no means serve the full vocational training needs of a student cohort, but it is a locally relevant and effective means of supplementing existing programs. Important features of the program include identification of the role of the employer or crafts person as a teacher rather than employer and the explicit inclusion of competency based training. The contract is completed when a student has acquired the negotiated competencies necessary to function in a particular skill area. Importantly the concept has operated to this point with the trainer receiving compensation instead of, or in addition to, the trainee. The trainer is compensated for the use of time, equipment and facilities. In addition the student receives school credit.

An additional feature of small labor markets is that they very often need, and could economically support, additional services but there is no business in the community providing the service, or if there is, they have no interest in expansion beyond a family business. This circumstance is described succinctly by Jonathan Sher who has noted that in many rural communities the best way to get a good job as a welder is to open your own welding shop. Consequently a major barrier existing between demand and people with skills who could potentially meet that demand is an absence of entrepreneurship. Because vocational training programs either intentionally or unintentionally assume that most graduates will enter the labor market as employees, there is relatively little training effort devoted to identifying such entrepreneurial opportunities and/or providing training on establishing and operating one's own business. We are convinced that rural areas today, especially those which have experienced significant population increase, are capable of economically supporting a wider range of services. However, we are equally convinced that this will mostly occur only as a result of additional entrepreneurial initiative. We have noted elsewhere in this report that increasingly expensive energy costs are likely to contribute to an expanding demand for various kinds of services in smaller communities as residents take more seriously the direct costs of going to larger regional centers for the things they need.

With regard to the above phenomenon we have data from all businesses in two counties in the Missouri Ozarks on their patterns of employment and their future employee needs. These data revealed, among other things, that few local businesses depend on employment services as a source of employees. Their main method of recruitment could best be described as "off the street". In addition, many had negative attitudes about personnel who had been trained through existing vocational programs. Their complaints included concerns that graduates

were too specialised, or that they had been trained using equipment that was not available in the locality, or that they had unrealistic (meaning metropolitan) expectations concerning working hours, compensation, etc. This latter point is of course a two-way street but it also demonstrates that smaller town businesses often operate on a different set of principles and expectations than larger, more urban-oriented businesses. If vocational training is going to be at least partially responsive to local needs, then these expectations need to be taken into account in establishing and carrying out training programs.

The survey of small businesses in the two-county area also produced a finding which has important implications for labor force entry. It was found that there were many small, family-operated businesses who were confronted with a greater demand for their service than they were able to supply. When confronted with the question of why they didn't employ some of the local trained young people to meet that demand, we frequently encountered the explanation that if their business were to become an employer it would then be responsible for making unemployment compensation payments, social security tax payments and be responsible for conforming to regulations that they had no desire to cope with. We take this as further evidence of the existence of a demand which is not being met because of the lack of appropriate mechanisms to translate that demand into employment or productive self-employment.

Need for more effective convergence of manpower programs

There are many manpower-related programs which operate in rural areas as well as urban areas. A problem of coordination among these exists. While there is some attempt to coordinate the administration of the various programs (through regional manpower committees), the fact remains that different agencies take responsibility for different programs and in practice they do not provide for an effective sequence of support of individuals through

various stages of training on to eventual employment. Consequently it is possible for an individual in need, to be a recipient of a 13-week work experience program, a short term PSE position, a manpower training position, etc. and end up going from "slot" to "slot" with no organized or coordinated preparation for some rewarding and remunerative career. We do not have any specific recommendation to offer regarding this problem, other than to call attention to its existence and the need for greater coordination at the level of the individual recipient.

Yet another source of complaint in rural areas with existing manpower programs is that it has proven to be difficult to coordinate the effort of various programs to achieve a combined application of skills and existing manpower to the accomplishment of important and visible community projects. One often hears the observation in rural areas today that WPA (of the 1930's) was instrumental in developing community parks, community buildings and other projects of lasting value to the community but that existing manpower programs have not been effective in producing those kinds of community projects. Again the problem seems to be one of lack of coordination.

School-community relationships and potential for resources for more particularistic training

A feature of the rural community is that usually the school occupies a more prominent place in the life of the community than in urban areas. A major reason is the lack of competing activities in the rural community. Consequently it is usually found that a higher percentage of the population of rural communities attend school events than in urban areas because it is the "only game in town."

This greater community-school nexus of rural communities places school administrators and teachers in more of a fish-bowl, but also contains the prospect for enhancing the resources of the school's educational program through greater involvement of community volunteers in the training and educational functions of the school. Consequently many kinds of initiatives which would be difficult to organize and administer in metropolitan areas are at least potentially more feasible in

smaller rural communities

Vocational Agriculture as a distinctive form of rural vocational education

Vocational agriculture training was stimulated primarily by the 1917 Smith-Hughes Act providing financial support for rural high schools to establish a program of study in applied agriculture. The original intent was to improve the competence of future farmers. This legistation is notable also becuase it simultaneously provided support to train the vocational agriculture teachers. Consequently departments of agricultural education soon sprang into existence in most land grant universities and in many state colleges.

As vocational agriculture programs expanded among rural high schools the organization of students (FFA - Future Farmers of America) which was to become virtually synonymous with vocational agriculture same into existence in 1928. Today approximately 80% of all secondary vocational ag. students are also FFA members. FFA membership in most schools having chapters is a highly visible status most distinguished by the blue corduroy jackets with gold FFA emblem and chapter name worn by members. The organization enjoys great national visibility, perhaps greater than any other youth organization. The annual national convention is often successful in attracting the President of the United States as the keynote speaker. The FFA identity extends even beyond the high school. The blue FFA jacket is seen as often as high school letter jackets on the campuses of many land grant universities.

A particularly interesting aspect of vocational agriculture education is its pattern of relatively slow but basically uninterrupted growth in the face of a continuous decline in the number of commercial and family farms in the United States. Since the inception of vocational agriculture programs the number of farmers has declined so that today there are only about 25 percent as many

farmers as when vocational agriculture came into existence. One possible explanation for this apparent contradiction may be found in the institutionalization of the program. One is tempted to conclude that FFA has been a contributing factor as well as the existence of teacher training programs. Another possible explanation may lie in the nature of the instructional program, the concepts that underlie it and its methods of instruction.

Vocational agriculture training at the secondary school level incorporates many instructional techniques and features not usually found in the instructional program in either vocational or academic subject areas. In our judgment the methods and techniques of vocational agriculture represent a sufficient departure from the norms of other forms of vocational education that the differences seem worthy of further explication. In our judgment, based on extensive work with rural schools over the past several years there are many features of the vocational agriculture program which are importantly adapted to various features of the rural school and the rural community. In the section on implications we intend to further develop a case for considering the methods of vocational agriculture for more widespread application to vocational training in rural areas. For that reason we are providing a brief discussion of some of the distinctive features:

a. Individual student projects - while most forms of vocational education rely on teaching by doing, vocational agriculture emphasizes student projects which are done outside the school, usually at the students' homes. There is an emphasis in evaluation of these projects on their economic return and marketability. Often the projects become the basis for entering competitions where the project is evaluated externally, e.g., calf projects at the county fair, etc. Because of the project orientation the vocational agriculture teacher is expected to (required to) make home visits to meet with the student and his/her family, to discuss and evaluate the project and simultaneously to become better acquainted with the student and his/her environment.

b. Vocational agriculture differs from most other vocational training in that the orientation of the program is generalist rather specialist. An underlying assumption is that graduates of the program will be prepared to become commercial farmers (although in the name of preservation there has recently been a somewhat greater emphasis on preparation for agri-business careers), an occupation which has traditionally been regarded as a jack of all trades. The vocational agriculture program typically includes sections on farm shop (carpentry, welding, engine maintenance, etc.); small engine repair; farm management including accounting, business management principles, etc; livestock production; crop production; marketing, etc. While the underlying philosophy of the program is to produce commercial farmers, it can be argued that students of the program may have better preparation to enter other non-agricultural occupations than graduates of vocational training programs which have not had the breadth of training received by vocational agriculture students. This might be expected to be particularly true of jobs in rural communities where economic conditions usually dictate a lower degree of occupational and skill specialization than is found in larger, metropolitan labor markets. In making this point a search was conducted of the existing literature to determine if any kind of comparative evaluation of the occupational careers of vocational agriculture versus other vocational students had been conducted. Such research may exist, but we were not successful in locating it.

c. Related to point (b), there is an emphasis in vocational agriculture training on entrepreneurship. The overall philosophy and content of the training is based on the underlying assumption that graduates will be farmers and that farmers are individual businesspersons/entrepreneurs. By contrast, most other vocational training seems to be predicated on the assumption that graduates will become employees. While it is not totally accurate

to claim that vocational agriculture is entrepreneurially-oriented and that all other vocational training is employee-oriented, the distinction does have some validity. In terms of outcomes that difference could be important in several different ways. One way in which it is potentially important is that in the context of a rural community the best (and most accessible) occupational careers are very often to be found in running one's own business. To the extent that that is true, it should provide the vocational ag. student an advantage in first perceiving a business opportunity and secondly, in having the management skills to effectively and profitably run a small business. Conversely, it may be that the vocational agriculture student might have greater difficulty adjusting to the circumstances of being an employee in a large organization. One could however, speculate that having been exposed to a more generalist and entrepreneurial orientation, the vocational agriculture student might enjoy an advantage over his/her specialized peers by having a broader conception of a job. Again a search of the literature, while not exhaustive, failed to produce any past research addressed to this issue.

d, Vocational agriculture differs from other vocational instruction areas also by its usual status as a relatively integrated full four-year program. Students are not required to take all four years but many do. It can be argued that a student who has gone through such an integrated program throughout his school career would have a stronger identity with the area in which he received training and would have a more integrated and holistic perspective of the career for which he received training.

e. While the potential significance of FFA was discussed earlier, it is emphasized again as a distinctive characteristic of vocational agriculture training. Certainly from a sociological point of view, it could be expected that FFA members might have a stronger identity with their area of training and have a greater sense of belonging and attachment in the context of the school. One could speculate as well that the existence of such an identifiable set of students could well have an effect on the instructor in the sense of building in a greater degree of commitment to "his/her" students as well as a greater sense of concern for the performance and future of individual students.

f. Explicit integration of academic subject matter with vocational training -- While vocational agriculture does not stand alone among the various vocations in this respect, it probably provides a more comprehensive integration than many other vocations precisely because of its generalist orientation. Vocational agriculture instruction includes the application of chemistry in the analysis of fertilizer, agricultural chemicals, soil testing, livestock medicines, livestock rations, etc.; the application of bookkeeping and economics in farm record keeping, farm management, marketing, etc; the application of math in calculation of rations, building estimates, planting rates, etc.; the application of biology in crop and livestock production, etc. In other words, while specific skills are taught, such as welding, a major emphasis in vocational agriculture instruction is on the application of various ideas and techniques from academic subject matter areas to the business of being a capable farmer.

g. Integration into affairs of the community -- Within the context of the rural community, FFA is deeply embedded in a strong traditional pattern of family - community interaction. Participation in FFA activities is a family pattern persistent over many generations, with strong familiar

support as brothers follow in the footsteps of fathers and grandfathers before them. Additionally, this strong tradition is supported by community endorsement of the pattern as FFA activities are integrated strongly into the ritualistic customs and annual events of the rural community, e.g. county fairs, rodeos, tractor pulls, etc. The traditional commitment to participation receives support that is integrated through familiar and communal reinforcement. Another feature of the vocational agriculture/ community connection is the extent to which vocational agriculture training is at least partially particularistic, i.e. sensitive to the type of agriculture found in the locality in which the program is offered. Agricultural production varies widely around the country and even between regions within the same state. Consequently while fruit and vegetable production and marketing might be more heavily emphasized in the San Joaquin Valley in California, beef cattle and feeder pig production would be more heavily emphasized in the Missouri Ozarks. In general there is a theme of greater sensitivity to local conditions that runs throughout the characteristics identified which combine to enhance community acceptance and support.

The above have been identified primarily to suggest some possible explanations for the continuing growth of vocational agriculture departments and students in the face of a decline in demand for farmers but also to suggest that there may be some value in beginning to more actively research whether the factors which distinguish agriculture from other forms of vocational education make any difference in the subsequent occupational career of students of both kinds of programs. While vocational agriculture has been discussed above, there has been a similar but less well institutionalized pattern of training in vocational home economics. Most of what has been said above is applicable to vocational home economics as well.

Rural community attitudes toward job expansion

There has been a significant amount of research done in recent years on the effect of rural industrialization. To some extent there has been a dispersion of industry over the past decade or two and at least some of this research has been oriented toward determining the effect on the rural community. Conclusions from the research are basically that industry in small towns is often a mixed blessing adding to the payroll but also producing a demand for additional services which typically must be provided from local tax revenues. Several studies have also shown that managerial and more highly skilled personnel often move in from the outside leaving less skilled and lower paying jobs to local residents. Thus, the addition to the economic base of the community does not produce a modification of the relative economic status of community residents. This area of research is reasonably well synthesized and additional integrative work is underway. (Summers, Rogers, et. al.)

Despite the mixed outcomes of the research on the impact of industry on rural communities, community residents seem almost unanimous in desiring additional industry. During the past five years the Office of Rural Development of the Unviersity of Missouri has assisted numerous communities, especially in southern Missouri, to do comprehensive community surveys. Included in each of these surveys has been one or more questions concerning public attitudes toward attraction of industry. In eight such surveys completed during the past five years, the percent of respondents desiring additional industry for their town ranged from a low of 70 percent to a high of 99 percent. Only two of the eight communities had fewer than 80 percent wanting additional industry and both of these could best be classified as bedroom towns. This finding was corroborated by a survey of all open country residents of five east central Missouri Ozark counties. Of the

approximately 3400 respondents, 80 percent wanted additional effort placed on attracting industry to the area. This is particularly interesting in view of the area being one which has been a recipient of significant population increase during the past 10 years. The findings are noteworthy in that there was no difference between recent in-migrants and long term residents in their attitude toward additional industrialization of their area. From recent surveys it can be safely concluded that at least in rural Missouri there is a favorable public attitude toward additional rural industrialization.

Areas of potential demand for services in rural areas

Although it is difficult to project demand for various skills in rural areas, there are certain generalizations which can be made from existing data. In part the projections offered here are predicated on at least population stability and probably increase in rural areas throughout the region. The projections are also based on the assumption that the increasing price of energy and individual private transportation will have a future influence on the patterns of location and demand for services in non-metropolitan areas. In the past, rural services, including the location of schools, hospitals, etc. have--either intentionally or unintentionally--been influenced by an assumed plentiful supply of relatively inexpensive energy and on the existence of individual private transportation as the means of reaching continuously more centralized important services. Our projections about areas of future demand for skills and services are also based on the assumption that unless there is very restrictive gasoline rationing that the present pattern of extensive commuting to work will continue in rural areas of the middlewest.

It is possible that rising energy prices may have yet another influence on several areas of the middlewest. As energy becomes more expensive it is possible that the population of the many large metropolitan areas of the region will begin taking vacation trips closer to home. If this assumption proves correct, it would

produce an important economic base impact on the Missouri Ozarks, on northern Minnesota, Michigan and Wisconsin as well as various areas in southern Ohio, Indiana and Illinois.

Closely related to this phenomenon, there are some who are now speculating that there will be a future growth of population in existing central cities but a population principally of more affluent whose places of work are located in the downtown areas of major cities. If this were to occur, there is further speculation that this would be accompanied by a further expansion of what is already a significant second home market. Second homes are numerous in the vacation areas of the region mentioned above.

In part, the population turnaround has been stimulated by an increase in the number of retired persons in our society and a decline in the age at which many are retiring. These trends may be expected to continue. An important aspect of retirement income is that recipients are free to live wherever they choose and their source of income will follow them. It would be our projection therefore that on into the foreseeable future, areas like the Missouri Ozarks are going to be perceived as desirable placed to live (retire).

Yet another factor which should have some effect on economic and employment opportunities in rural areas in the future is the restoration of services lost to many localities throughout the past 30 to 40 years as a result of the unrelenting trends of specialization with concomitant specialization. Perhaps in no area is this more evident than in health care services. The shortage of physicians in many rural regions has created a great deal of concern among many rural residents.

In addition to the above energy related assumptions, we are also projecting that there will be a societal move toward preservation - that maintenance or restoration of old things will become an increasingly important value. We expect also

that the growing strength of the handicraft market is more than a short-run fad and that there will be a longer term demand for hancrafted items, direct marketing of consumable farm products, antiques, works of art, etc.

Based on the above assumptions we are making the following guesses concerning some areas of prospective rural employment growth, especially in areas that are likely to continue to increase in population in the short run.

Health Care - As noted above, there is a serious shortage of various health care providers in many rural areas of the region. Most conspicuous by their absence are physicians and dentists; but, given the interdependence of health care today, there are many support and ancillary services which are essential to a comprehensive health care system. There are many initiatives underway to increase the supply of professional health care providers such as the National Health Service Corps, Rural Health Initiatives, etc.

The implications for vocational training would seem to lie in an expansion of demand for all kinds of realted health care provider roles in the future. These would include emergency medical technicians, dental hygienists, nurses at all levels from lpn's through nurse practitioners capable of independent practice, various therapists, dieticians (to serve the needs of the various senior citizen meal programs, nursing homes, etc.), lab technicians, etc.

Suggesting an expected strengthening in demand for health related vocations in rural areas reinforces an issue of increasing importance in the constellation of vocational education. That is the issue of continuing education. Much of the focus on vocational training seems oriented toward initial labor market entry. Much less emphasis seems directed toward maintaining competence; especially in fields characterized by relatively high levels of technology.

Suggesting an expected demand for health care providers and support personnel raises a question also of the basis on which demands for training are founded. We offer the observation that in most states there are various existing agencies and organizations which have the capability of supplying data pertinent to projection of demand for trained personnel in various fields. With regard to health care, for example, there is in place across the country a set of Health Systems Agencies responsible for comprehensive health planning. These agencies serve all areas of the country and are in close contact with the communities in the areas they serve. Consequently they are in a realtively good position to offer advice to vocational educators on prospective demand for various health care skills. Our suggestion is that in addition to the various vocational school advisory boards that more planning and demand projection occur at the level of the vocational school for the area it serves. In most cases there are existing agencies which could supply pertinent data to guide such planning.

Computer technologists - The rapidly moving developments in microprocessor technology are likely to produce widespread applications of computers into many areas of living. Rural areas are not likely to be left behind in this movement - they may in fact move more quickly toward individual use than urban areas. Today there is widespread use of personal computers and microprocessors on commercial farms.

Commercial agribusiness firms, university agricultural extension systems and others are beginning to utilize microprocessors and to develop soft ware applicable to the solution of various farm problems. In many rural communities throughout the midwest the largest business by far, is the local farm supply and marketing cooperatives which often may have an annual sales volume in the $5 - $10 million range. These businesses employ highly sophisticated technology in materials handling and business management. Many already employ relatively large scale computers for

record-keeping and management purposes. With less expensive microprocessors and more applications being developed constantly, it can be expected that their utilization will expand as rapidly in rural areas as urban.

Repair and service - It is characteristic of both commercial and hobby farmers that they possess many items of mechanical equipment. There are numerous small engines - chain saws, rototillers, power lawnmowers, cement mixers, water pumps, air compressors, etc. which will undoubtedly expand in number as the number of persons residing in rural areas increases. Repair services for these items is in short supply and will undoubtedly continue to be in short supply.

In addition to small engine repair, there is a concomitant demand for related services of all kinds - parts, welding, on-the-farm tire repair and overhaul and repair of larger equipment, e.g. tractors, dozers, self-propelled combines, etc.

In addition to the above there is also a demand for other repair services of all kinds - automotive repair, especially body and fender work and home repair of all kinds, e.g. plumbing, wiring, minor carpentry, refrigeration and air conditioning, etc. These services seem to be generally in short supply even in smaller cities and urban areas.

Two features of the above kinds of opportunities which have implications for vocational training are: (1) in most cases the person needs to be trained as a generalist - the person who repairs lawn mowers and rototillers in the summer must be prepared to repair chain saws, snow mobiles and snow blowers in the winter. Similarly since most small communities do not have sufficient population to support full-time plumbers, electricians, etc, the demand can best be met by persons having skill in two or more areas. (2) Most of the above opportunities can best be realized by the person who provides the service by going into business

Business, accounting and tax services - In recent years in urban America there has been an increasing separation of the record-keeping and accounting functions away from the primary business and toward specialists providing such services; often with the benefit of modern computer technology. It is conventional wisdom among most small business analysts that a major reason for failure of small businesses is their inability to keep adequate records and to make decisions on the basis of their accounting data. Being able to purchase such a service then could be important to the economic viability of many small businesses.

Although there are a surprisingly large number of small businesses in most small towns, there are very few rural towns that have an accounting service. Consequently most business people perform these functions for themselves, often at the expense of doing additional business. With the availability of increasingly more understandable and capable computer technology, it seems apparent that the businesses of most small towns could more inexpensively contract for such service than perform it themselves.

However this are is one again which is dependent on entrepreneurship in order to be translated into a good employment opportunity.

Law enforcement - In recent years there has been an expansion of employment in law enforcement in rural counties. Stimulated in part by funds through LEAA, and also by increasing crime rates, the number of law encorcement officers in many rural counties has doubled during the past decade. A problem faced by many rural communities however is that there are relatively few people available to them who had had training in any aspect of law enforcement. Especially in areas subject to increasing population, it can be expected that there will be a relatively small but stable demand for persons having law enforcement training.

Transportation and other personal services - There is almost a total void of transportation services in rural communities except those that are confined to the use of certain segments of the population: OATS, school busses, etc. Perhaps because OATS is limited with regard to who may use it, the program is always in need of extensive subsidy and still moves from one fiscal crisis to the next. Similarly, as mentioned earlier, school transportation is becoming such an expensive function that it may require additional ingenuity in the future concerning type of equipment, methods of operation, etc. It would appear that the day is rapidly approaching, if it is not already here, when there will be a demand for privately operated public transportation. However, if such a demand exists, or will soon become more evident, the necessary skill to convert it into employment opportunities will be management and coordination, not the operation and maintenance of vehicles.

Child care - A phenomenon which has swept rural America to at least the same extent as urban America is employment of women outside the home. Despite a high percentage of working mothers in rural communities, we have found few communities in Missouri Ozarks which have any formalized system of child care. State approved day care centers are mostly confined to towns of 5,000 or greater. Meeting this demand however, introduces the now familiar problem - entrepreneurship. The demand is there but in most cases no organization is in existence to respond to the demand and employ people who would interested in that field.

Retail business opportunities - In the section on socio-economic changes in Missouri, it was emphasized that the past decade has witnessed an important shift in retail sales in the direction of smaller rural trade centers (8,000 - 20,000 population). To these communities much of the expansion is basic to the local economy in the sense that it is attracting dollars into that community from an outlying area. Thus it would appear that some of the franchise businesses, which appear to be

significantly responsible for the disproportionately large gains in those places, have the capability of producing a local economic multiplier. It would seem therefore that many area vocational schools should be giving consideration to providing training for direct and indirect services associated with expanded retailing in towns of that size (which typically often are also the location of the area vocational school).

It is probable that discount stores, franchised hardware and building supply stores, discount drug houses, etc. will capture much of the market for the kinds of items they carry for not only the community in which they are located but also for a significant trade area. This suggests that some kinds of merchants in smaller outlying towns will find themselves being unable to compete with the franchised businesses except on the basis of either convenience or quality. If the above assumptions are correct then what future might be expected for small retail business in smaller rural communities? We would suggest the following generalizations: (1) smaller town businesses will probably be able to compete most effectively on the basis of convenience - greeting cards, groceries, gasoline, miscellaneous expendable hardware items, bakery goods, etc. and service - not only the sale of major items but also providing for delivery, repair, parts, etc. The discount houses generally involve a return to the concept of the general store but on a high volume basis. The general stories is probably a viable concept for the future of the small town but the conditions of viability are more likely to be convenience and service. (2) There appears to be a demand for retail businesses which provide a unique product. A recent extensive community survey in an Ozark town of 5,000 showed great public interest in additional restaurants even though there are several good ones in the town. Quality restaurants would seem to have a solid future in many small towns - especially considering the significant

increase in number of working women and the fact that surveys show more than 40 percent of meals eaten by Americans are eaten away from home. It is also well established that many small town restaurants can be successful in establishing a reputation for some unique feature which attracts business from outside the locality.

Other business falling in this same category include (although subject to more conditions of failure) nurseries, flower shops, gift shops, craft shops, antique stores, furniture refinishing shops, etc.

Energy related careers

Rural households generally have a greater requirement for energy and a greater capacity to adapt to energy scarcity and produce alternative sources. Shifting to alternative sources as well as adoption of conservation practices may be productive of additional employment in rural areas and has already generated a demand for skills that are in short supply. This is particularly true in the middlewest with severe winters and hot summers.

In attempts to conserve existing energy sources there has been a sharp rise in the use of wood burning stoves. Skilled personnel are needed for their installation and maintenance. Many rural home owners wish to retrofit their homes for improved conservation, but the engineering competence to recommend the most cost-effective measures and the skilled personnel to do the retrofit work are in short supply.

There are many small scale technologies for the production of energy at a farm and home level - a potentially practical alternative on farms and rural communities. These include methane digesters for biomass conversion, production of vegetable oil as a fuel the use of solar collectors for heating crop drying, etc., production of ethanol for fuel, wind and hydro generation of electrical power, etc. All these technologies and more are practical alternatives for rural areas and are likely to be in widespread use in the near future. There are few people in rural areas who currently have the skill to construct and/or maintain these alternative technologies. It is an area of potentially great demand for technical skills which is relatively unique in rural localities.